



Learning in the 21st Century: **Taking it Mobile!**

Blackboard **K-12**



Executive Summary

As mobile devices become ubiquitous, students are utilizing them to facilitate learning and enhance productivity in and out of school. As uncovered in the Speak Up 2009 data and outlined in the report *“Creating Our Future: Students Speak Up about their Vision for 21st Century Learning”* students state a clear preference for using mobile devices that allow them to work un-tethered from traditional school boundaries. They also desire the opportunity to learn using digitally-rich curriculum and have a preference for learning through collaboration with peers. Through mobile devices and instant access to the Internet, students now see the world as their classroom and they have clearly stated that using their own mobile devices anytime or anywhere to learn will help them improve their personal productivity and learning. Today’s students are Free Agent Learners, taking more and more responsibility for their learning into their own hands (Project Tomorrow 2010).

In the recent past, administrators and students have been at loggerheads about the use of mobile devices at school. Typically, educators’ initial reaction is to ban the use of these devices in school. However, some innovative educators are seeing things differently...particularly those who are active users of mobile devices in their personal lives and who have begun to integrate these devices into instruction and classroom management strategies. In fact, instead of seeing mobile devices as a problem, these educators embrace mobile devices as a catalyst for reshaping learning into an un-tethered, more student-directed mobile learning experience.

Through the Speak Up data findings and related interviews and focus groups, we are beginning to see mobile learning take shape in pockets around the nation where a small but growing number of innovative educators are finding ways to leverage the once-banned mobile devices for learning. For example, students in ISD279-Osseo Area Schools (MN) use their mobile devices and Google Docs™ to work on their writing assignments. Students at St. Marys City School District (OH) are creating presentations using Sketchy™ from photographs they have taken of geometric shapes in their classroom or on the school grounds with their smartphones. At Jamestown Elementary School (VA), students use their mobile devices to create multimedia projects, improve their writing skills, and collaborate with their peers. And high school students in Onslow County Schools (NC) use smartphones to learn algebra, geometry and calculus. The reviews thus far are promising with parents reporting more communication about learning with their children and teachers reporting that students’ planning skills are improving.

What’s causing the shift in thinking? As educators use mobile devices themselves for productivity and learning they recognize the same values students realize when using mobile devices. What’s more, parents are also gradually beginning to accept the role of mobile devices as instructional tools and show a willingness to purchase them for their child(ren) for educational purposes. Another driving factor is the reality of school budgets. Administrators are keenly aware of the costs of implementing

major technology initiatives and they can see that having students use the devices they already own may very well help them achieve their goals more affordably.

Are there roadblocks? Teachers' concerns are evident and they include students being distracted from core learning processes, equitable access to mobile devices and, perhaps the most significant question, how to integrate mobile devices effectively and meaningfully into instruction.

This report examines the Speak Up responses from a new cohort of education innovators that we are identifying as Mobile Learning Explorers, as well as students. Interviews with six Mobile Learning Explorer educators and one student representing five different school districts and one private school help verify the survey results and provide additional context for the data findings. Key findings include:

- Access to smartphones has more than tripled among high school students since 2006.

Furthermore, students no longer view their school's Internet filters as a primary barrier to using technology at school; but rather, the primary barrier is the inability to use their own devices, such as cell phones, smartphones, MP3 players, laptops or net books.

- 62 percent of responding parents report that if their child's school allowed devices to be used for educational purposes, they would likely purchase a mobile device for their child.
- The use of mobile learning devices for productivity, organization, collaboration and learning is highly personal and extremely customizable. Unlike typical innovations, mobile learning implementations require greater flexibility and often times are directed by the students' or parents' preferences. For the first time, educators have an opportunity to help students learn more effectively and deeply by leveraging students' preferred learning tools and strategies.
- Administrators agree that the top barriers for implementing mobile devices in their schools and districts are the need for focused professional development for teachers and current policies related to network security,



Speak Up Survey Methods

The Speak Up National Research Project is a national initiative of Project Tomorrow, the nation's leading education nonprofit organization dedicated to ensuring that today's students are well prepared to be tomorrow's innovators, leaders and engaged citizens. In fall 2009, Project Tomorrow surveyed 299,677 K-12 students, 26,312 parents, 38,642 teachers, and 3,947 administrators representing 5,757 schools and 1,215 districts including public (97 percent) and private (3 percent) schools. Schools were located in urban (38 percent), suburban (31 percent) and rural (32 percent) communities. Over one-half of the schools were Title I eligible (an indicator of student population poverty) and 42 percent of the participating schools had more than 50 percent minority population attending. Additionally, for the first time, Project Tomorrow surveyed 1,987 college students enrolled in teacher preparation programs. Participating college students represented seventy-one different colleges with 69 percent reporting themselves as undergraduates in education or related majors or teacher preparation programs and 31 percent in graduate programs. Of the participating colleges, 94 percent were 4-year public institutions and 6 percent were 4-year private institutions. Overall, the Speak Up 2009 sample respondents represents a wide range of experience with mobile devices (including smartphones, MP3 players, and net books).

To provide additional insight into how mobile learning is developing in schools of all sizes across the United States, the Speak Up research team also conducted five executive interviews with educators and one high school student involved with mobile learning programs or initiatives. Interviews were conducted with a technology program leader from a private girls' high school in an urban setting (Xavier College Preparatory, Phoenix, AZ), an eighth grade science teacher and information technology director in a suburban school district (Paradise Valley Unified School District, Phoenix, AZ), as well as a technology director from a rural school district (St. Marys City School District, St. Marys, OH), an elementary-level instructional technology director from a suburban district (Jamestown Elementary School, Arlington, VA), a chief technology officer from a large urban district (ISD279-Osseo Area Schools, Maple Grove, MN) and an 11th grade student from a small city school district (Onslow County School District, Jacksonville, NC). Excerpts of these interviews are included in this report and the detailed profiles are available at http://www.tomorrow.org/speakup/MobileLearningReport_2010.html

“Mobile learning: *Learning a variety of content and skills anytime, anyplace with a small device light enough to be carried in one hand.”*

Chris Dede,
Timothy E. Wirth Professor in Learning Technologies,
Harvard University

digital equity and cell phone use. Interviews with administrators and teachers illustrate that the most successful mobile learning initiatives are often driven by the school or district's own vision and culture, and an overriding motto of “just do it.” These administrators provide insight for overcoming concerns about implementing mobile learning.

- Stories emerging from the mobile learning initiatives highlight that administrators are focused on creating an environment and culture where students have the opportunity to work collaboratively with their peers, using mobile devices they are most comfortable with and leveraging a wide range of emerging digital resources and tools.
- Educators continue to pioneer the use of mobile devices within their classrooms, however the ability to provide mobile learning opportunities 24/7 is hampered by the cost of broadband access and the federal and state funding policies that prohibit students from using district-provided mobile devices at home. While the recently announced E-Rate Wireless Pilot program provides schools an opportunity to explore the potential for mobile learning, widespread adoption will require longer term sustainable changes.

Profile of Mobile Learning Explorer

This report looks at mobile learning through the eyes of students and the Mobile Learning Explorer teachers and administrators who use and are supportive of the use of mobile devices for learning. This group of educators, a subset of the national data, has positive experiences using mobile devices in both their personal and professional lives. In fact, the Mobile Learning Explorer administrators are twice as likely to have a smartphone, and four times more likely to have a netbook than their peers. This growing familiarity is likely prompting these educators to think differently about the value and potential of mobile learning in the instructional environment.

Not only are the Mobile Learning Explorer teachers and administrators utilizing a variety of mobile devices, but also they are strong proponents for the effective integration of technology within instruction; 100 percent of these educators report that the effective implementation of technology is extremely important to student success. Mobile Learning Explorer teachers are also currently using mobile

90 percent of the Mobile Learning Explorer administrators state that mobile computers increase students' potential for success, as compared to 59 percent of the non-Mobile Learning Explorer administrators.

- Speak Up 2009 Survey

devices (such as a smartphone) or mobile computers (such as laptops) in their classroom. And the Mobile Learning Explorer administrators report they would definitely include mobile devices or mobile computers in their vision for the ultimate 21st century school.

This group of educators is significantly more likely than their peers to recognize the value of mobile devices for increasing student engagement. Mobile Learning Explorer administrators typically report much higher expectations for technology's potential than did their non-Mobile Learning Explorer counterparts. For example, 90 percent of the Mobile Learning Explorer administrators state that mobile computers increase students' potential for success, as compared to 59 percent of the non-Mobile Learning Explorer administrators.

Interestingly, as teachers begin to use mobile devices their perceptions shift regarding the obstacles they face using technology in school. Mobile Learning Explorer teachers see fewer barriers. They are less likely to report that computers or other tech equipment are not available (31 percent compared to 41 percent of classroom teachers, in general) and also less likely to report that they don't know

how to integrate technology into their lesson plans (4 percent compared to 10 percent in general). This underscores the Mobile Learning Explorer teacher's "higher value proposition" for technology in general, and their experience in overcoming barriers effectively.

To be sure, Mobile Learning Explorers currently represent a small subset of the national body of educators, but their perspectives are powerful because they are on the leading edge of the mobile learning trend. Through the Speak Up responses of the Mobile Learning Explorers, this report uncovers current trends in mobile learning and investigates key considerations and the barriers that may challenge progress.

Have we reached the tipping point to leverage mobile learning?

Student access to mobile devices has increased dramatically. So dramatically in fact, that many districts have begun to re-think the potential for student-owned devices within instruction. Smartphone ownership among high school students has more than tripled since 2006 when only 9 percent of high school students reported ownership of a smartphone. The story has several

interesting and intriguing components. Notably, mobile usage spans the K-12 student spectrum. It's not just high school students that are avid device users. Elementary and middle school students have increasingly widespread access to mobile devices as well (Table 1). And students are quite adept at using multiple technology platforms, applications, and new technologies.



Table 1: Student Access to Mobile Devices

	K-2nd grade	3rd-5th grade	6th-8th grade	9-12th grade
Cell phone (w/o internet access)	18%	29%	59%	67%
Smartphone (w/ internet access)	14%	17%	24%	31%
Laptop/tablet PC	27%	32%	53%	60%
Netbook or mini-notebook computer	n/a	n/a	11%	10%
MP3 player	36%	55%	80%	85%
Hand-held game player	47%	60%	64%	48%

There's another dramatic change as well. Unlike in the 2008 study, students no longer view their schools' Internet filters as a primary barrier to using technology while on campus. Instead, when asked how schools could make it easier to use technology for school work, students' responses indicate that they want to use their own devices. Students in middle school (60 percent) and high school (64 percent) prefer using their own cell phone, smartphone or MP3 player compared to laptops or netbooks (46 percent).

This change from 2008 to 2009 underscores a major shift taking place. While previously students felt constrained by the Internet filters and firewalls at their school, now they can access the Internet from their mobile devices. As a result, they indicate that school-based filters

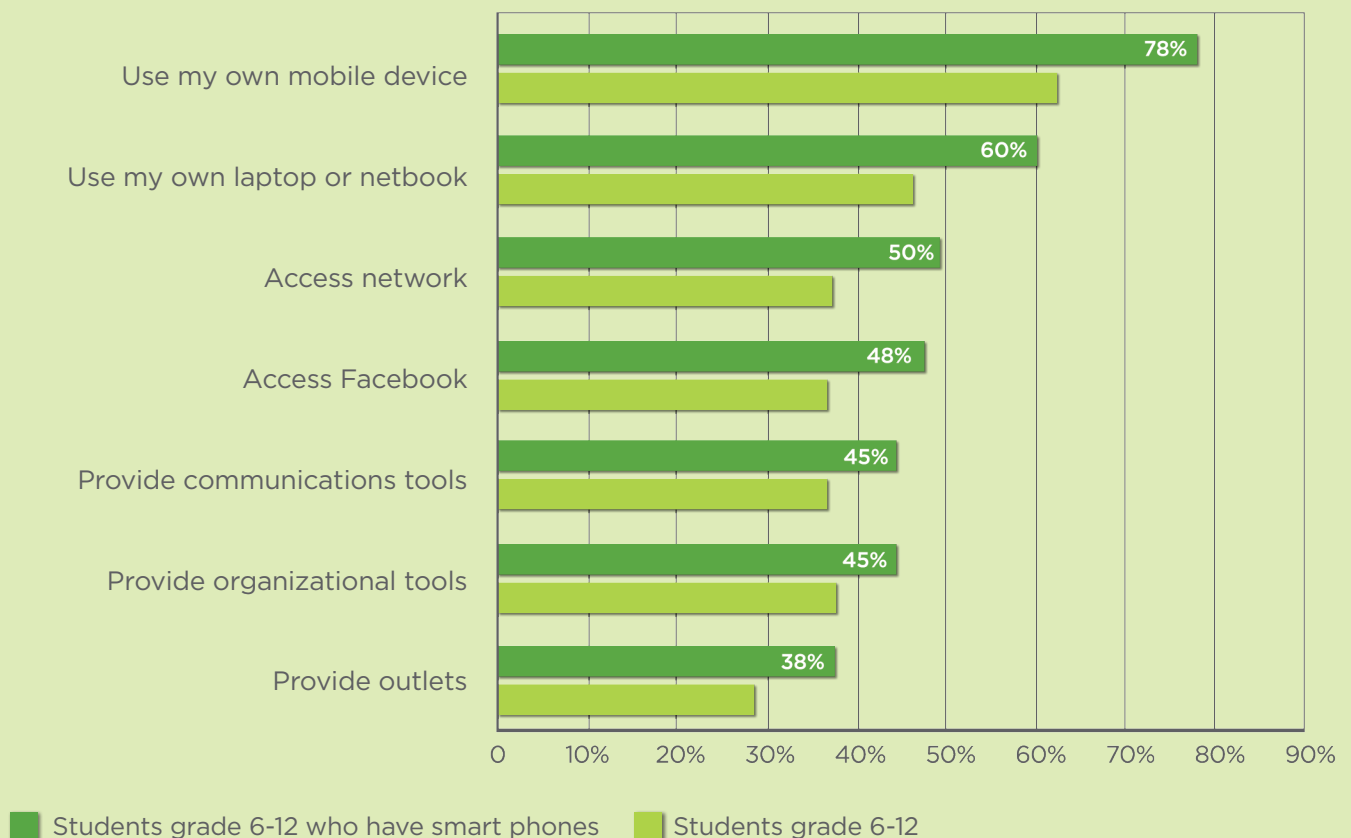


are no longer holding them back. Quite logically, students now report that the policies that prevent them from using their own mobile devices for learning are the biggest barriers they face to using technology at school.

And when asked to design their “ultimate school” and envision the tools that would have the greatest positive impact on learning, over half (56 percent) of all the middle and high school students cite “mobile computers for every student” (such as a laptop, mini-notebook, or tablet PC). Further, 52 percent of all middle and high school students state that mobile devices, such as cell phones or MP3 players, would have the greatest positive impact on learning. Remarkably, even our youngest students in kindergarten through 2nd

grade respond that they would include mobile devices such as cell phones or smartphones with Internet access (42 percent), MP3 players or iPods (46 percent) or laptop computers for every student (52 percent) in their ultimate school. Students’ vision for un-tethered learning can become a reality if embraced by educators. In **Madison City Schools (AL)**, the Speak Up data revealed that their students did not want to use networked devices provided by the district; they wanted to bring their own! So Madison City Schools listened to their students and created a one-to-one initiative where students could bring to school mobile devices that best served their learning needs to use in their classes. Of course, the students still wanted network access and so

Figure 1: Students’ recommendations for making it easier to use technology for schoolwork



the district assigned a network username to each student and created a segmented WiFi network to provide safe network access. This pilot initiative resulted in several interesting, unforeseen results. Students used the mobile devices that best suited their needs and learning preferences and many parents took the new initiative as an incentive to purchase devices for their children to use in school. And the students reported that many of their teachers, now faced with a classroom of laptops, were becoming more interested in how to leverage the devices within learning.

As students construct their ideal mobile learning environment they envision access to their school network and Facebook, as well as access to tools for communications and collaboration (see Figure

1). Not surprisingly, students who already have access to a mobile device such as a smartphone have an even higher expectation for using those devices at school.

Mobile Devices: Engagement Amplified Equals Productivity

In the not-too-distant past, cell phones were dedicated to only telephonic communications. Today's technology is putting new multi-function, multimedia devices in the hands of students, educators, and parents. And while these technologies captivate and engage students, they can do far more. Mobile devices have opened a new era in instructional and personal productivity benefits for learners and educators. What's



more, their enhanced features and functionality appeal to different users at different ages, all across the teaching and learning continuum.

The Speak Up 2009 survey asked students how they would like to use mobile devices to help with schoolwork. Their responses cover both instructional benefits and productivity advantages (Table 2). Students report using mobile devices to look up information on the Internet, take notes, or record lectures or access online textbooks. At **Jamestown Elementary School (VA)**, Camilla Gagliolo, the school's instructional technology director, has seen the power of mobile learning first hand. This school began using handheld devices in 2004 to support writing instruction. Now, the school provides device "tool kits" for every grade level. Gagliolo notes, "Our tool kits include iPods, iPads, iPod Touches and Nintendo DSs. We use these in a variety of ways, with a special focus on content delivery skills, creativity, and collaboration. Using the devices provides an immediate and transparent way to do research, practice math facts, take notes and create presentations as well as access the ever growing number of available learning apps. We are trying to tap into their interests and enthusiasm for the technology that they use on a daily basis. For example, during a language arts lesson, elementary school students use their mobile devices to read an article or book of their choice. As they work their way through the reading assignment, the students discuss the story with their classmates, write notes or create visual representations in preparation for their final presentation. Once the reading, note taking and discussions are completed, students create a final presentation to share with their classmates. Students complete the entire

assignment on the mobile device, streamlining the entire process and giving students the ability to quickly organize their thoughts and presentation in a way that works best for each of them individually. If we apply the ways students learn outside of school inside school, we have a better chance of reaching them. And we are seeing parents purchasing more of the educational applications that we are using during school for learning outside school."

At **Explorer Middle School (AZ)**, 8th grade science students work in teams and use their smartphones to collect data during science experiments. The students enter their data into Google Docs™ using their smartphones and then send the data to the class website. "Instantly, we see everyone's results and discover trends in the



data together. I am assessing students' grasp of concepts in real time. The students really respond to this kind of work and our administration has been supportive as well. Parents like it too. Our class web site really helps to serve as the hub for all of the hands-on work our students do," according to Carola Montana, 8th grade science teacher. Montana encourages teachers and administrators to "Go for it."

In **Onslow County School District (NC)**, high school students participating in the Project K-Nect pilot program solve interactive math problem-sets in their class and use the video, instant messaging and blogging capabilities of the district provided smartphone to discuss real-world math applications and strategies for solving problems in their algebra, geometry and calculus classes.

Students Envision Using Mobile Devices for Productive Learning

Students envision using mobile devices for far more than simply talking with or texting one another, dispelling a common myth of adults and pointing the way toward effective use of mobile learning. Besides communication, students want to use the devices to access Internet resources for schoolwork and notably, students also want to receive reminders or alerts on their mobile device about homework and tests. For many adults, leveraging a wide range of smartphone applications helps to increase their productivity; now we see that students want to realize those same benefits as they relate to their educational productivity. Also, there is evidence of a growing use of social networking sites for instructional,

Table 2: Students envision using mobile devices to learn and enhance productivity

How would you use a mobile device to help with your schoolwork?	Students Grades 6th-8th	Students Grades 9-12th
Instructional Uses		
Look up information on the Internet	63%	71%
Take videos of class presentations or experiments to study from later	48%	37%
Access online textbooks	44%	48%
Play educational games	44%	31%
Take notes or record lectures so I can refer to them later	29%	56%
Productivity Uses		
Communicate with classmates (via email, IM, text, or chat)	58%	64%
Receive reminders or alerts on my cell phone about homework and tests	55%	58%
Work on projects with my classmates	53%	55%
Organize my schoolwork	48%	53%
Learn about school activities	41%	44%
Communicate with teachers (via email, IM, text, or chat)	39%	52%
Share and edit calendars, or organize bookmarks	39%	30%
Create or share documents, videos or podcasts	36%	42%
Coordinate calendars with classmates or share bookmarked websites	33%	37%
Upload or download information from my teacher's website and/or the school portal	30%	40%

Table 3: Mobile Learning Explorers recognize the benefits of using mobile devices

What do you think is the most significant value of incorporating mobile learning devices (smartphones, PDAs, and MP3 players) into instruction?	Administrators (All)	Mobile Learning Explorer Administrators with Mobile Devices
Enhance productivity		
Improves teacher-parent-student communications	50%	65%
Increases teacher productivity	28%	40%
Helps teachers improve their technology skills	44%	55%
Extend opportunities for learning		
Increases student engagement in school and learning	74%	93%
Provides a way for instruction to be personalized for each student	50%	74%
These devices help to extend learning beyond the school day	53%	72%
Provides a way for students to informally review classroom material	37%	56%
Provides opportunities for informal remediation	32%	53%
Develop students' 21st century skills		
Prepares students for the world of work	55%	76%
Students develop collaboration and teamwork skills	38%	60%
Students develop critical thinking and problem solving skills	38%	59%
Students develop stronger communications skills	38%	61%

Data derived from the subset of Mobile Learning Explorers who use mobile devices in their personal and professional lives.

collaborative, and productivity purposes, with 48 percent of high school students and 34 percent of middle school students now reporting that they use their profiles on Facebook and other social networking sites to collaborate with classmates on projects.

Students are already using a variety of technologies as part of their regular school day or to complete their homework assignments and the use of mobile learning devices is a perfectly logical “next step” for them. Mobile devices are flexible, convenient, multi-functional – and always on, in much the same way that today’s “Free Agent Learners” are always “on” for learning. This point is critical because the use of mobile devices

mirrors the way students interact and learn today. In the past, educators have attempted to introduce technologies that were not an inherent part of the students’ world. Mobile devices are today an integral part of many students’ lives and thus the adaptation of such devices as learning tools is a significant difference.

Mobile Learning Explorers Lead the Charge...and the Change

Educators are beginning to consider the potential benefits of leveraging student-owned devices. And there are multiple drivers at work, propelling their changing ideas. In the recent past, the traditional approach to providing students



When looking at the responses of the administrators, it's clear that the Mobile Learning Explorers who are already using these devices in their own personal and professional lives are more likely than their peers to see the multiple advantages for integrating devices into instruction (Table 3).

There are several important implications from this data. The use of mobile devices has the potential to change the nature of schooling. With 24/7 access, administrators see learning extended beyond the traditional school day, opening new avenues for remediation, acceleration, and improved school-to-home connections. There's another side benefit as well. Mobile Learning Explorers note that the use of mobile devices can also improve teachers' technology skills (55 percent), and improve teacher productivity (40 percent).

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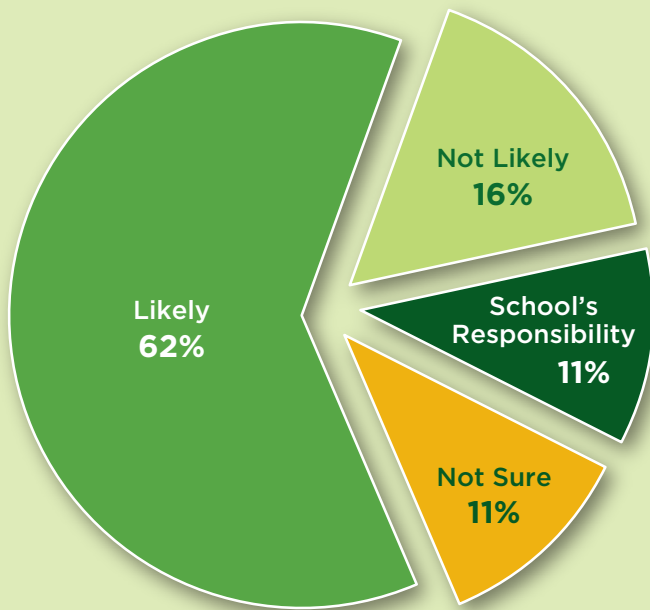
- Taking it Mobile Report

with access to their own laptops was through 1:1 programs, but this can be costly and often simply not affordable. Today, as mobile devices become more available, educators are using them in their own personal and professional lives and they're experiencing the advantages and productivity gains firsthand.

Are mobile devices an effective tool for learning or a distraction?

Educators and students see many of the same advantages in mobile learning, including improved communications, opportunities to review instructional materials outside normal class hours, and collaboration. Overwhelmingly,

Figure 2: Parents willingness to purchase mobile devices for their child to use at school



administrators and classroom teachers agree that using mobile devices can improve student engagement and learning. They see potential for personalizing instruction and developing students' 21st century skills, such as critical thinking, problem solving, communications, collaboration, and teamwork (Table 3). Yet, teachers have concerns as well, particularly around the potential that students will be distracted doing other things such as surfing the Internet, texting or playing games.

Administrators and teachers who use mobile devices are more familiar with the realities and promise of their use and are challenging the myth that students will be distracted from their core learning tasks. Encouragingly, administrators who are Mobile Learning Explorers are less

concerned about students being distracted (37 percent) than their peers (43 percent).

Champions of the mobile learning model, however, will need to work closely with classroom teachers, who continue to express high levels of concern (76 percent) that students will be distracted, to help them realize the power and potential of learning with mobile devices. Tim Wilson, chief technology officer from **ISD 279-Osseo Area Schools (MN)** encourages his teachers to make their lessons so interesting that students don't feel the need to wander. Given that students can wander with or without technology, he reminds his teachers they are still responsible for managing the learning process in the classroom and can tell the students to "put them away" if needed.

Will the “Back-to-School Shopping List” soon include a student-provided mobile device?

While administrators recognize the value of providing students with technology-enabled learning opportunities, they also recognize the associated costs. “Ours is a large district, with 21,000 students. Because of the size, we don’t have dedicated technology funding to support a major one-to-one initiative. But now there is a revolution in mobile technology, and the prices have dropped tremendously,” according to Wilson from **ISD 279-Osseo Area Schools (MN)**. In Osseo, there are several mobile device programs growing, with student-provided devices. Wilson notes, “We seeded the program, but now the goal is student-provided devices. Some schools can do their own fundraising if they want, that’s up to them. It’s not a lot different from students having to purchase a graphing calculator. Colleges and universities have been doing this for years.”

Interestingly, parents seem to be jumping on board. The Speak Up 2009 data show that parents are supportive of students’ use of mobile devices at school. In fact, 62 percent of responding parents reported that if their child’s school allowed devices to be used for educational purposes, they would likely purchase a mobile device for their child (Figure 2).

How is learning changing for Mobile Learning Explorers and students?

“Mobile devices are modernizing the way that students communicate and work with their teachers. Today, when a teacher assigns something, students are asking to use a mobile learning device or a drawing program to draw something out or create a chart or concept map. So now kids have a real impact on how and where they are going to learn,” observes Kyle Menchhofer, district technology coordinator, **St. Marys City School District (OH)**.

Students participating in Project K-Nect in **Onslow County School District (NC)** find that discussing math using the Project K-Nect tools and instant access to their classmates via IM improves their learning experience. At the beginning of the semester, students receive smartphones with Internet access, which they can use at school or home. The smartphones enable collaborative problem-solving and provide a way for the students to seek out personalized support from their teacher or fellow students when they are stumped by a difficult math concept. Additionally, the students learn from each other through classroom created blogs and videos, and through instant messaging with their classmates and teacher – both at school and even after school on the school bus! The

“With 24/7 access, administrators see learning extended beyond the traditional school day, opening new avenues for remediation, acceleration, and improved school-to-home connections.”

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students in the Project K-Nect pilot are leveraging both their collective expertise and seeking out new relationships with peers who may have more proficiency in certain math concepts. According to Thomas, an 11th grade student at **Dixon High School (NC)**, this virtual connection to all of the students in their class anytime, anywhere is a powerful tool that he wishes he had at his disposal in other classes as well.

Students who might otherwise fall behind have an opportunity to succeed through mobile devices. Menchhofer in **St. Marys City School District (OH)** highlighted how mobile devices made a difference for students in his district who had horrific handwriting. He found that a few teachers were not being objective when grading handwritten papers. Rather than assigning a grade based on content, the teachers were subconsciously giving students a bad grade because they could not read the student's writing. Now, with the keyboards, the students can get their thoughts down on paper in a fashion that a teacher can read. "The students are now able to fully participate," notes Menchhofer.

High Velocity Innovation

Mobile learning projects are new and often "leading edge." As yet, there aren't many well established models for success. However, there is excitement, interest, and rapidly growing acceptance as the education community continues to explore a kaleidoscope of approaches and options. Innovation at this velocity can be what one educator described as "messy." In its early stages, teachers and administrators will need to develop comfort

with ambiguity. Further, they'll need a clear understanding that because these devices can do many things (games, calculations, reminders, e-reading and more)...the process will be unlike any innovations that have come before.

In **St. Marys City School District (OH)**, mobile devices provided by the district are implemented grade-level by grade-level to minimize any missteps and teachers are encouraged to find their own way to integrate them into instruction. To support their programs the district invests in extensive professional development and as a result, teachers meet on their own sometimes once a week and as a larger group, once a month, to discuss advanced uses. Teachers are also helping each other more via email. "Our experience is that teachers are looking for ways to become more

"Our experience is that teachers are looking for ways to become more effective in the classroom and mobile learning is a great tool to facilitate this."

Kyle Menchhofer,
District Technology Coordinator,
St. Marys City School District

effective in the classroom and mobile learning is a great tool to facilitate this. The positive energy that is being generated has infiltrated our district, and it has been awesome,” shares Menchhofer.

At **Xavier College Preparatory (AZ)** innovation began with the parents. Catherine Wyman, program director for technology, explained that parents were the impetus for their implementation of mobile learning. The process started out of the parents’ concern when their daughters arrived at college and did not know how to use a course management system. Subsequently, the alumnae parents worked with the Board of Trustees to form a committee to complete a comprehensive needs assessment and over a two- year period, they interviewed a diverse group of stakeholders, conducted

extensive research into best practices and developed a strategic plan. The plan outlined the expectations for creating an academically rigorous environment, fostering individual accountability and collaborative learning. As a result of the plan, the school strengthened its infrastructure and hired a technology program director. “The planning process not only made way for mobile learning but equally important, it clarified the technology standards and competencies the school would implement,” according to Wyman.

Realizing the Vision of Mobile Learning Environments

Administrators generally, and Mobile Learning Explorer Administrators to a greater degree, agree about the barriers and concerns they face



Table 4: What prevents administrators from allowing students to use their own mobile devices?

	All Administrators	Mobile Learning Explorer Administrators
Best Practice		
Absence of best practices and role models	33%	36%
Implementing effective acceptable use policies	30%	30%
Policy Issues		
Current district policies about using cell phones in school	56%	55%
Concerns about theft of the devices at school	54%	52%
Concerns about network security	54%	57%
Digital equity amongst students	48%	55%
Internet safety concerns and district liabilities	45%	45%
Infrastructure		
Challenges associated with the variety of hardware and software products	37%	42%
Ability to provide network connectivity	31%	37%
Policies on software licenses and usage	22%	26%
Curriculum & Instruction		
Lack of specific curriculum to support the devices	37%	39%
Teachers are not trained in how to use mobile devices within learning	51%	58%

regarding the use of mobile devices (Table 4). They are keenly aware of the challenges they will need to grapple with as they consider allowing students to use their own mobile devices as a part of daily school life and instruction.

In fact, Mobile Learning Explorer administrators are more concerned in most cases about the barriers associated with letting students use their own mobile devices, which is partially a result of these administrators' greater familiarity with the devices' capabilities and functions. Hence, even though they are more concerned than their peers, they have a more realistic context

for envisioning how to deploy mobile devices successfully to serve authentic instructional purposes. Their higher expectations about the value of mobile devices balanced with their practical experiences position help them to effectively deal with the challenges ahead.

Administrators are equally concerned with their teachers' ability to integrate mobile devices within instruction, as well as network security. The Mobile Learning Explorers highlighted in this report provide valuable insight into strategies for addressing these barriers. Jeff Billings, information technology director,

Paradise Valley Unified School District (AZ),

shares that “a little bit of creativity and focus can have amazing results.” With nearly 16,000 mobile devices in use, the district is working to open networks for personal devices and developing new professional development programs to help educators integrate them effectively into instruction. “We’ve taken the stance that we want students and the members of our learning community to use our network. We’ve had minimal problems. I tell other educators considering a transformation like this to give their frontrunners freedom and be creative to establish new models and then let the others follow in those footsteps.”

Policy considerations are, of course, part of the picture. “It’s been very easy for us, so I think that really there shouldn’t be anything standing in the way of any school attempting this type of initiative. We haven’t changed any school policies and we didn’t modify our Acceptable Use Policy because ours is very general, and is very elastic toward changing technology. From a policy standpoint, nothing should be holding you back,” notes Wilson of **ISD 279-Osseo Area Schools (MN)**. As school districts implement mobile learning initiatives, they have an opportunity to evaluate their policies and explore creative alternatives for providing solutions. For example, rather than managing the added network traffic and Internet filters attributed to mobile devices at the district level, Menchhofer of **St. Marys School District (OH)** contracted out these services to their broadband service provider. This solution gave him the ability to more effectively utilize his staff for other projects and meet the policy mandates.



Even though one-half of administrators cited the potential theft of the mobile devices as a barrier to implementing mobile devices, this was not a concern for the educators we interviewed. In **St. Marys City School District (OH)**, all of the devices are registered and students do not have access to texting or cell services. If stolen, the district staff can completely shut down a mobile device rendering it useless. In **ISD 279-Osseo Area Schools (MN)**, the district took a position that students could bring any type of mobile device to school and they would find a way to get each device on the network. This included everything from an iPad to a Nintendo DS device. Wilson notes that though he was initially very concerned about the theft issue, it has not proven to be a problem in their district.

How are educators addressing digital equity?

Over one-half of the Mobile Learning Explorer Administrators are concerned that not all students will have access to mobile devices. Sometimes this concern becomes a reason for not pursuing mobile learning initiatives. However, student access to mobile devices is not limited to only students in affluent communities. In fact, analysis of the Speak Up responses from students across the nation from a variety of communities in urban, rural and suburban locations reveals very little difference in the percentage of students with personal access to these devices.

From a practical standpoint, however, as educators implement mobile learning initiatives, it is important to address the real or presumed issue of digital equity. Some, like **ISD 279-Osseo Area Schools (MN)**, are “seeding” their programs by providing devices to students who may

not have their own. Similarly, in rural Ohio in **St. Marys City School District (OH)**, mobile learning devices and broadband access are provided to students free-of-charge. Through a combination of government pricing, as well as e-rate and free and reduced lunch funding, the district has implemented a cost-effective program for students. It is Menchhofer’s belief that at some point the cost to the consumer will be low enough that parents will be able to pay for the device and broadband access for their child.

Other schools encourage students to share devices. Still others have determined that the school or district will take responsibility for providing students with mobile devices. Prices for devices continue to become more and more affordable, as is the cost of a data or voice plan. As with other technology initiatives, the overall costs of implementation including costs for providing devices and service continues to factor prominently in schools’ ability to create a fair and equitable learning environment for all students.

How do educators support a variety of devices?

Infrastructure issues are also critical to the successful implementation of mobile learning on a large and sustained scale. This will require educators to rethink a “cookie cutter” approach to technology implementation. Instead, educators might consider focusing on building a stable technology backbone with applications that can function reliably across many mobile devices.

At **Xavier College Preparatory (AZ)**, the educators share the technology decision with the parents. There is a shared belief that the family is responsible for the education of their child

and, therefore, parents make the decision about what device is right for their daughter. Wyman considers their school “platform agnostic” and supports any mobile device a parent selects for their daughter, from smartphones to laptops or netbooks. For students who cannot provide their own device Xavier College Preparatory is developing a program to provide them with mobile devices, according Wyman.

Likewise, teachers in **ISD 279-Osseo Area Schools (MN)** select the devices they want to implement. Some want to use mobile, hand-held technology and students are encouraged to bring cell phones, iPods, or Nintendo DS's. At other schools, teachers are more interested in laptops and students are encouraged to bring their own laptops. Wilson envisions the district providing the network infrastructure for learning that students can plug into with their devices. Wilson realizes this isn't exactly revolutionary; yet it is consistent with the

district's desire to provide support and leadership. “We're really letting our schools and teachers grow with this,” observes Wilson.

How are educators integrating mobile devices into the curriculum?

Some schools start with a specific subject area, for example, at **Jamestown Elementary School (VA)**, they began their mobile learning program focused on specific areas that needed instructional improvement. They started with writing and then grew to math, and have expanded the program from there. Providing a first step was much easier to manage than trying to apply the technology across the curriculum reflects Gagliolo.

Teachers in **ISD 279-Osseo Area Schools (MN)** use the Google Docs™ to facilitate collaboration amongst students. Students work on a writing assignment, and rather than printing it, share the



document with their peers and their teacher for editing and subsequent revisions. This process provides formative assessment of the student's work through the entire assignment.

In **St. Marys City School District (OH)**, teachers use the Go-Know tool-kit to create lessons that work across a variety of mobile device platforms. During a typical math lesson, students may create a concept map using PiCo Map™, take photographs of math shapes they find in their classroom and create presentations using Sketchy™. Students upload their presentations to GoManage to share with their classmates and become part of their electronic portfolio.

Lessons from the Mobile Learning Explorers

What we're learning from those leading the charge, our nation's Mobile Learning Explorers, is that the use of mobile learning devices for

productivity, organization, collaboration and learning is highly customizable. This level of personalization demands new levels of technology sophistication, new curriculum adaptations, and new approaches to everything from professional development to infrastructure so that the use of devices genuinely impacts learning and achievement in positive, quantifiable new ways. Yet, in order to truly realize the power of mobile learning initiatives, it is important to address the costs and policies related to providing students with broadband access 24/7. As with any innovation, we can expect things to be at times chaotic and confusing, as best practices, effective policies, and successful processes emerge and evolve.

To be sure, as educators develop strategies to meet the needs of today's Free Agent Learners for un-tethered learning, socially-interactive instructional opportunities, and digitally rich



learning environments there are key questions waiting for answers. The use of mobile devices in school may indeed hold some of the answers. The critical question educational leaders and innovators will need to address include possible shifts in the way districts plan for and invest in technology. Will school districts make strategic investments in infrastructure and professional development while encouraging students and their parents to support the use of student-owned mobile devices? Will policies actually change to allow students to use their own mobile devices as needed? How will schools address concerns about theft, Internet safety, and network security? The models may not

And, so we are at a tipping point today in terms of learning in the 21st century. Students have personal access to mobile devices, and educators and parents are equally interested in how to effectively leverage these always-on, multi-functional, pocket-friendly tools for learning and personal productivity. But while we discuss and deliberate on the challenges and opportunities afforded by mobile learning, our nation's students are already adapting the devices and a whole host of related applications and tools to implement their own vision for 21st century learning and they are not going to wait for the rest of us to catch up. As noted in this report,

Some innovative, forward thinking educators are already “taking it mobile” and addressing the students’ desire for un-tethered learning.

be as far away as some may think. As an example, students bring their own calculators to school and they’re paying fees for art materials and other curriculum resources. The use of student-owned mobile devices is not dramatically different. If educators leverage these kinds of approaches in their thinking about mobile learning, innovation and progress have the opportunity to make new connections with improved student engagement, productivity, and success.

some innovative, forward thinking educators are already “taking it mobile” and addressing the students’ desire for un-tethered learning. In the process, they must address the many challenging policy and infrastructure issues required to make mobile learning a reality in their schools and districts. Let’s follow the lead of these Mobile Learning Explorers and pave a new path for 21st century learning together.

References

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About Project Tomorrow

Speak Up is a national initiative of Project Tomorrow, the nation's leading education nonprofit organization dedicated to ensuring that today's students are well prepared to be tomorrow's innovators, leaders, and engaged citizens. Since fall 2003, the Speak Up National Research Project has annually collected and reported on the views of over 1.85 million K-12 students, teachers, administrators and parents representing over 23,000 schools in all 50 states. The Speak Up National Research Project dataset represents the largest collection of authentic, unfiltered stakeholder input on education, technology, 21st century skills, schools of the future and science and math instruction. Education, business and policy leaders report using the data regularly to inform federal, state and local education programs. For additional information, visit www.tomorrow.org.

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Blackboard K-12

650 Massachusetts Avenue, NW 6th Floor
Washington, DC 20001
1-800-424-9299, ext. 2427

15707 Rockfield Blvd
Suite 250
Irvine, CA 92618
949 609-4660 ext 17

